

REMARKS

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully reviewing the present application and indicating that claims 22-28 are allowable. Further, Applicant thanks the Examiner for the courtesies extended in the telephonic Examiner Interview of October 28, 2004.

1. Disposition of Claims

Claims 1-28 are pending in the present application. Claims 1, 8, 15, and 22 are independent. The remaining claims depend, directly or indirectly, from claims 1, 8, 15, and 22.

2. Claim Amendments

Claims 1, 8, and 15 have been amended to incorporate the limitations that (i) an area of the metal layer that linearly extends across the metal layer extends from an edge of the metal layer to another edge of the metal layer and (ii) there is an absence of vias between the area and the bump. No new matter has been added by way of these amendments as support for these amendments may be found, for example, in Figure 5a of the present application.

3. Rejection(s) under 35 U.S.C § 102

Claims 1-21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,736,791 issued to Fujiki *et al.* ("Fujiki"). Independent claims 1, 8, and 15 have been amended in this reply to clarify the present invention recited. To the extent that this rejection may still apply to the amended claims, the rejection is respectfully traversed.

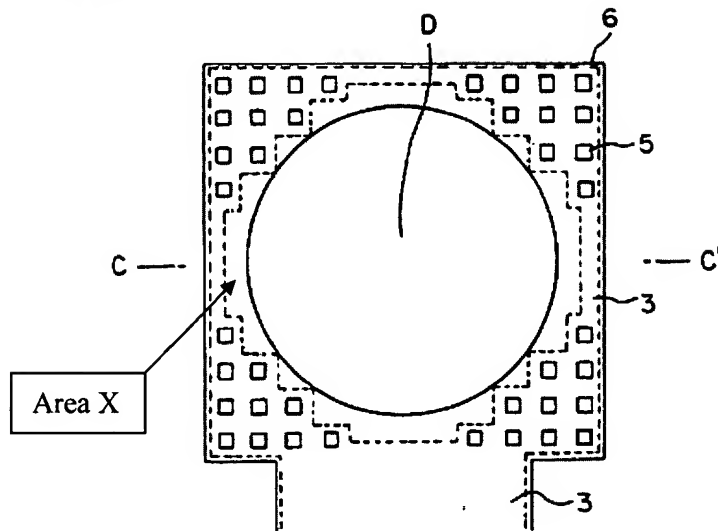
The present invention is directed to a structure for bumps and vias that allows for increased current distribution uniformity around the bumps. As shown in the exemplary

embodiment of the present invention in Figure 5a, a first plurality of vias (57a) is separated from a second plurality of vias (57b) by a third plurality of vias (57c). The density of vias connected to the first region and the density of vias connected to the second region are greater than the density of vias connected to the third central region, located between the first and second regions.

Additionally, a portion of the metal layer M8 separates the bump (44) from the vias (50). As shown in Figure 5a, this area of the metal layer between the bump (44) and the vias (50) allows current from vias (50a) to flow along arrow (53a) and current from vias (50b) to flow along arrow (53b). As exemplarily shown in Figure 5a and as required by amended independent claims 1, 8, and 15 of the present application, this portion of the metal layer linearly extends from an edge of the metal layer to another edge of the metal layer. Further, as exemplarily shown in Figure 5a and as required by amended independent claims 1, 8, and 15 of the present application, there is an absence of vias between this linearly-extending area of the metal layer and the bump.

In contrast to the present invention, Fujiki fails to disclose at least the limitations of amended independent claims 1, 8, and 15 of the present application discussed above. Fujiki discloses a device having a multilayered wiring structure with an interlayer insulation layer (4) such that when the wiring layers are electrically connected, cracks are not formed in the interlayer insulation layer (see Fujiki, Abstract). As shown below with reference to Figure 7 of Fujiki, the bonding pad structure of Fujiki has a first wiring layer (3), via holes (5) at the corners of the bonding pad, and a second wiring layer (6). However, as required by amended independent claims 1, 8, and 15 of the present application, there is no area of the metal layer (6) that linearly extends from an edge of the metal layer to another edge of the metal layer, where there is an absence of vias between the area and the bump.

FIG. 7



In the Office Action of September 9, 2004 and in the Examiner Interview of October 28, 2004, the Examiner relied on the area X of the metal layer of Figure 7 of Fujiki as linearly extending across the metal layer (6) and being laterally disposed between the landing pad portion and both the first plurality of vias and the second plurality of vias. However, the area X of the metal layer (6) specified by the Examiner does not meet the limitations of amended independent claims 1, 8, or 15 of the present application. Namely, the area X of the metal layer (6) is not an area of the metal layer that linearly extends from an edge of the metal layer to another edge of the metal layer, where there is an absence of vias between the area and the bump.

Further, in the Examiner Interview of Oct. 28, 2004, the Examiner suggested that an area extending between, for example, the two left-most columns of vias shown in Figure 7 of Fujiki does extend from one edge of the metal layer to another edge of the metal layer. However, such an area in Fujiki is not capable of being defined such that there is an absence of vias between the area and the bump as required by the claimed invention.

As seen with reference to Figure 5a of the present application and as required by amended independent claims 1, 8, and 15 of the present application, exemplary embodiments of the present invention have an area of the metal layer M8 that linearly extends from an edge of the metal layer to another edge of the metal layer. No vias are present between the area and the bump (44). As described previously with reference to Figure 7 of Fujiki, no area of the metal layer of Fujiki can be defined that linearly extends from an edge of the metal layer to another edge of the metal layer, where there is an absence of vias between the area and the bump

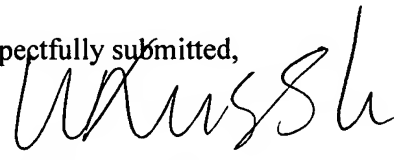
As Fujiki fails to disclose at least the limitations of amended independent claims 1, 8, and 15 discussed above, independent claims 1, 8, and 15 are patentable over Fujiki. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

4. Conclusion

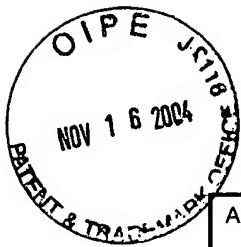
Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226/156001; P6864).

Dated: November 16, 2004

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